SmartNode™ SN200
Analog Telephone Adapter and VoIP Gateway

User Manual

CE

This is a Class B device and is not intended for use in a residential environment.

REGULATORY MODEL NUMBER: 13269D4-001

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Trademark Statement

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Warranty Information

Patton Electronics warrants all SmartNode components to be free from defects, and will—at our option—repair or replace the product should it fail within one year from the first date of the shipment.

This warranty is limited to defects in workmanship or materials, and does not cover customer damage, abuse or unauthorized modification. If the product fails to perform as warranted, your sole recourse shall be repair or replacement as described above. Under no condition shall Patton Electronics be liable for any damages incurred by the use of this product. These damages include, but are not limited to, the following: lost profits, lost savings and incidental or consequential damages arising from the use of or inability to use this product. Patton Electronics specifically disclaims all other warranties, expressed or implied, and the installation or use of this product shall be deemed an acceptance of these terms by the user.

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About this guide

This guide describes the SmartNode 200 hardware, installation and basic configuration. For detailed software configuration information refer to the *Trinity Command Line Reference Guide* and the available Configuration Notes.

Audience

This guide is intended for the following users:

- Operators
- Installers
- Maintenance technicians

Structure

This guide contains the following chapters and appendices:

- Chapter 1, starting on page 13, contains what you need to quickly start using the SN200.
- Chapter 2, starting on page 15, provides information about SmartNode device features and capabilities
- Chapter 3, starting on page 21, contains an overview describing SmartNode device operation and applications
- Chapter 4, starting on page 24, provides SmartNode device installation procedures
- Chapter 5, starting on page 30, leads you through the steps to set up a new SmartNode device and download a configuration
- Chapter 6, starting on page 35, contains information on contacting Patton technical support for assistance
- Appendix A, starting on page 38, provides compliance info for the SmartNode device
- Appendix B, starting on page 40, contains specifications for the SmartNode device
- Appendix C, starting on page 44, provides cable recommendations
- Appendix D, starting on page 48, describes the SmartNode device's ports and pin-outs
- Appendix E, starting on page 51, describes how to obtain factory configuration settings for the SmartNode device
- Appendix F, starting on page 53, describes the *Reset* button functions
- Appendix G, starting on page 58, provides the End User License Agreement

For best results, read the contents of this guide *before* you install the SmartNode device.

Precautions

Notes and cautions, which have the following meanings, are used throughout this guide to help you become aware of potential SmartNode device problems. *Warnings* relate to personal injury issues, and *Cautions* refer to potential property damage.

Note Highlights a helpful tip to help the user work more efficiently.

The alert symbol and IMPORTANT heading calls attention to important information.

The shock hazard symbol and WARNING heading indicate a potential electric shock hazard. Strictly follow the warning instructions to avoid injury caused by electric shock.

The alert symbol and WARNING heading indicate a potential safety hazard. Strictly follow the warning instructions to avoid personal injury.

The shock hazard symbol and CAUTION heading indicate a potential electric shock hazard. Strictly follow the instructions to avoid property damage caused by electric shock.

The alert symbol and CAUTION heading indicate a potential hazard. Strictly follow the instructions to avoid property damage.

Safety when working with electricity

The SmartNode device contains no user serviceable parts, and is not be opened by the user. The equipment shall be returned to Patton Electronics for repairs or repaired by qualified service personnel.

Mains Voltage: In systems without a power switch, line voltages are present in the power supply when the power cord is connected. The mains outlet used to power the SmartNode device shall be within 10 feet (3 meters) of the device, be easily accessible, and protected by a circuit breaker.

For AC powered units, ensure that the power cable used meets all applicable standards for the country in which it is to be installed, and that it is connected to a wall outlet which has earth ground.

For units with an external power adapter, the adapter shall be a listed Limited Power Source.

Hazardous network voltages are present in WAN ports regardless of whether power to the SmartNode is ON or OFF. To avoid electric shock, use caution when near WAN ports. When detaching the cables, detach the end away from the SmartNode first.

Before handling the device, disconnect the telephone network cables to avoid contact with telephone line voltages. When detaching the cables, detach the end away from the SmartNode device first.

Do not work on the system or connect or disconnect cables during periods of lightning activity.

Deutsch

Warnhinweise:

Dieses Gerät ist NICHT für den Anschluss an das Telefonnetz (PSTN) bestimmt und auch NICHT dafür zugelassen. Es ist nur für den Anschluss an Endgeräte beim Kunden vorgesehen.

- Das Gerät entält keine austauschbaren Komponenten und ist vom Benutzer nicht zu öffnen. Bei Systemen ohne Netzschalter und ohne externes Netzteil liegt Netzspannung im Gerät an, wenn das Netzkabel angeschlossen ist.
- Bei Geräten mit externem Netzteil muss das Netzteil die Anforderungen an eine zugelassene Stromquelle mit begrenzter Leistung erfüllen. Die Steckdose, die für die Stromversorgung des Gerätes verwendet wird, sollte höchstens 3 Meter vom Gerät entfernt und leicht zugänglich sein sowie durch einen den örtlichen regulatorischen Anforderungen entsprechenden Schutzschalter abgesichert sein.
- Für mit Wechselstrom betriebene Geräte muss sichergestellt sein, dass das verwendete Netzkabel alle gültigen Normen des Landes erfüllt, in dem es eingesetzt werden soll.
- Für mit Wechselstrom betriebene Geräte, die 3-polige Netzstecker haben (L1, L2 u. GND oder Phase, Neutralleiter u. Schutzleiter), muss die Steckdose geerdet sein.
- Für mit Gleichstrom betriebene Geräte muss sichergestellt sein, dass die Verbindungskabel für Spannung, Strom, erwartete Temperatur, Entflammbarkeit und mechanische Wartbarkeit geeignet sind.
- WAN-, LAN- u. PSTN-Ports (Anschlüsse) können unter gefährlicher Spannung stehen, unabhängig davon, ob das Gerät ein- oder ausgeschaltet ist. PSTN bezieht sich auf Schnittstellen wie Telefon, FXS, FXO, DSL, xDSL, T1, E1, ISDN, Voice, usw. Diese sind als „gefährliche Netzwerkspannungen“ bekannt. Um einen elektrischen Schlag zu vermeiden, muss in der Nähe dieser Anschlüsse mit Vorsicht gearbeitet werden. Werden Kabel von diesen Anschlüssen getrennt, zuerst das Kabel am anderen Ende herausziehen.
- Während eines Gewitters darf nicht am Gerät gearbeitet werden und es dürfen keine Kabel angeschlossen oder vom Netz getrennt werden.

In Übereinstimmung mit den Anforderungen der Richtlinie 2002/96/EG über Elektro- und Elektronik-Altgeräte (WEEE) muss sichergestellt sein, dass Altgeräte von anderem Abfall und Schrott getrennt werden und dem Sammel- und Verwertungssystem für Elektro- und Elektronik-Altgeräte in Ihrem Land zum Recycling zugeführt werden.

General observations

Do not stack multiple SmartNode devices directly on top of one another, and do not place items on top of the device. If you will be installing equipment above the SmartNode device, leave at least 2 inches (5 cm) of clearance between the devices.

Furthermore, leave at least 2 inches (5 cm) to the left, right, front, and rear of the SmartNode device for proper ventilation.

In accordance with the requirements of council directive 2002/96/EC on Waste of Electrical and Electronic Equipment (WEEE), ensure that at end-of-life you separate this product from other waste and scrap and deliver to the WEEE collection system in your country for recycling.

- Clean the case with a soft slightly moist anti-static cloth
- Place the unit on a flat surface and ensure free air circulation
- Avoid exposing the unit to direct sunlight and other heat sources
- Protect the unit from moisture, vapors, and aggressive liquids

Chapter 1 SN200 Series Quick Start

Chapter contents

Default IP Settings

ETH 0/0:

- 192.168.200.10 | 255.255.255.0
- DHCP Client

Default Login

Username: *admin*

Leave the password empty

Press the *Enter* key after the password prompt.

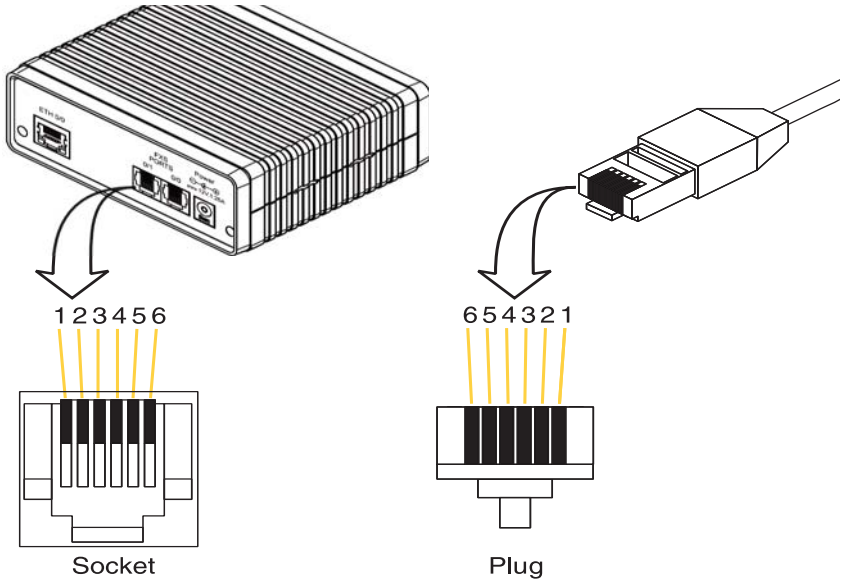
IMPORTANT

You are responsible for creating a new administrator account to maintain system security. Patton Electronics accepts no responsibility for losses or damage caused by loss or misuse of passwords. Refer to Chapter 4 "Accessing the CLI", section "Selecting a secure password" in the *Trinity Command Line Reference Guide* for more details.

Analog Port Pinout

FXS ports use an RJ-11 connector with 6 positions. The middle 2 positions (3 and 4) are used as follows:

Note Pins not listed are not used.



Pin	Signal
3	Ring (-)
4	Tip (+)

Chapter 2 General information

Chapter contents

SmartNode 200 overview

The SmartNode 200 Analog Telephone Adapters (ATA) and VoIP Gateways (see figure 1) support up to four telephone connections, integrating legacy phones and fax machines into a UCC environment. High quality voice and reliable fax over any IP network. All-IP does not end when analog terminals have to be integrated. Security and quality guaranteed.

Figure 1. SmartNode 200

The SN200 ATA and VoIP Gateway is equipped with 1, 2 or 4 FXS analog interfaces, and provides the following major functions:

- Analog telephony to voice over IP (SIP) conversion for 1, 2 or 4 FXS analog ports or 1 FXS and 1 FXO
- Fax T.38 and G711 bypass support
- One Ethernet port
- ACL (access control list)
- Secure Zero Touch Provisioning
- QoS

Optionally, the product supports (at additional cost):

- SIP-TLS/SRTP

Note For the up-to-date listing of available models, refer to the SmartNode VoIP page at https://www.patton.com/products/voip-comparison.asp.

SN200 rear panel port and LEDs definitions

Depending on the model, SN200 ATAs have 1, 2, or 4 analog FXS ports (see figure 2).

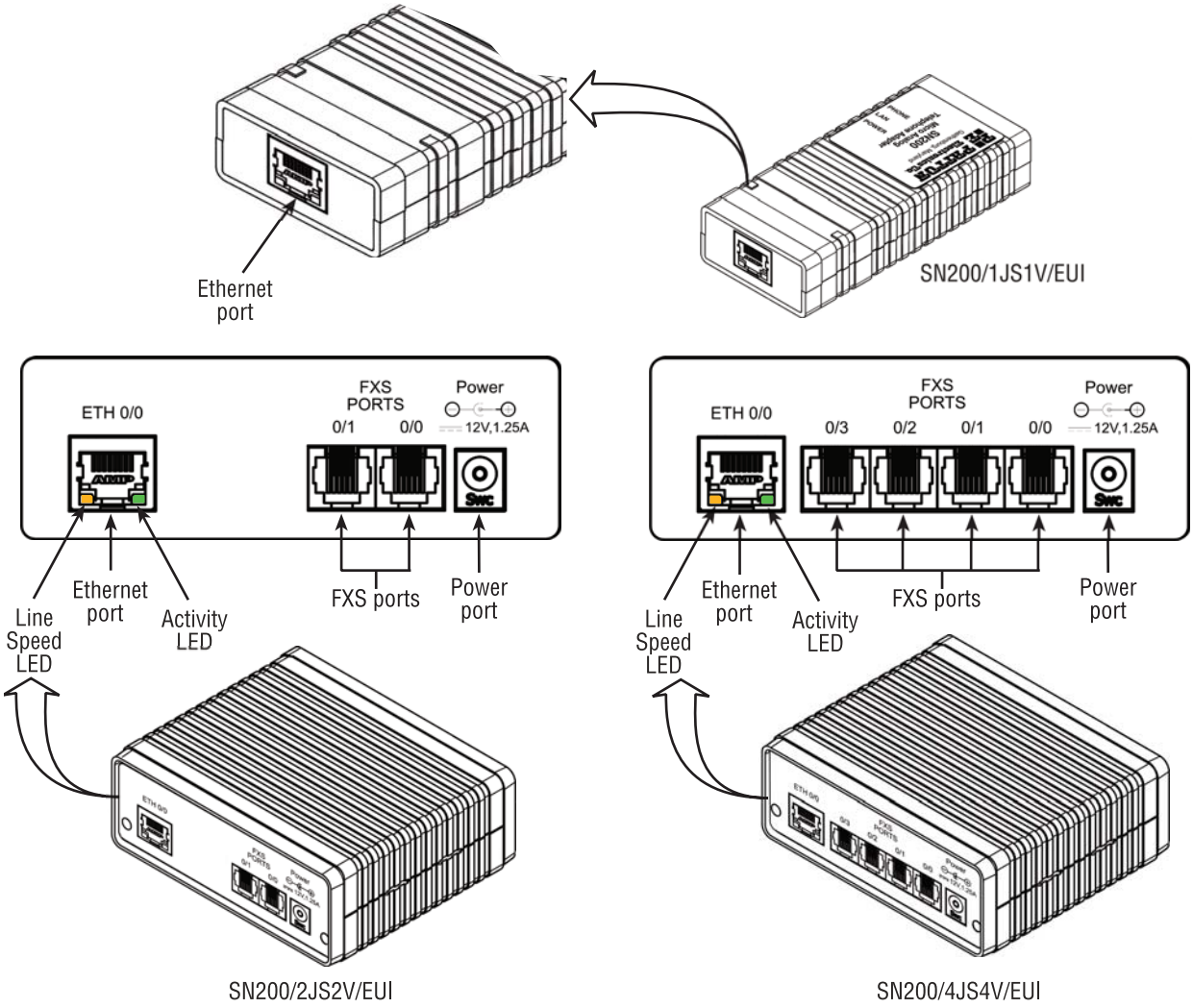


Figure 2. SN200 rear panels

SN200 rear panel ports and LEDs are described in table 1.

Table 1. Rear panel ports and LED Definitions

Port/LED	Description
Ethernet port ETH 0/0 (The SN200/1JS1V/EUI Ethernet port is not labeled)	RJ-45 connector that connects the SmartNode device to an Ethernet device (e.g., a cable or DSL modem, or LAN switch).
Analog voice ports, FXS 0/0–0/3 FXO 0/1	FXS RJ-11 (6 position, 4 wire) connectors that connect the SmartNode device with an analog terminal (a telephone, for example) FXO RJ-11 (6 position, 4 wire) connectors that connect POTS lines as per (ETSI EG201 188).
Power port	The SmartNode device requires 12 VDC, 1.25 A power for operation. Every SmartNode device comes with an external power supply converting from AC to DC power (100–240 VAC, 50/60 Hz).
Ethernet port line speed LED	• When lit, the SN200 is operating at 100 Mbps • Off indicates the SN200 is operating at 10 Mbps **Note** The SN200/1JS1V/EUI Ethernet port has no LED on the connector, it is located on the side - described in the front panel LED description.
Ethernet port activity LED	• When lit, indicates the Ethernet connection has a link indication. • Flashes when data is received or transmitted at the Ethernet port. **Note** The SN200/1JS1V/EUI Ethernet port has no LED on the connector, it is located on the side - described in the front panel LED description.

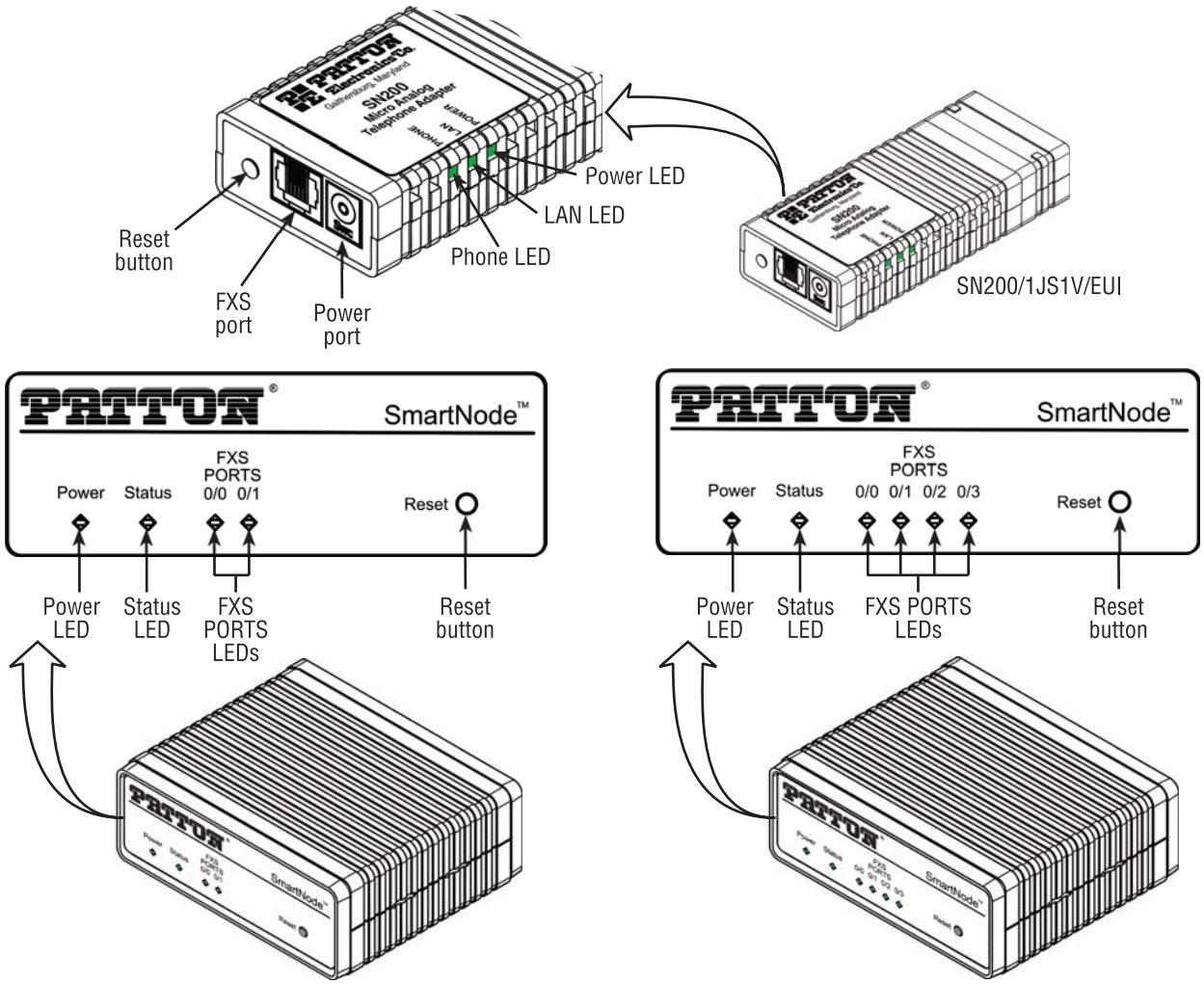


Figure 3. SN200 front panels

SN200 front panel LED and button definitions

figure 3 shows SN200 LEDs and the Reset button; the definitions are listed in table 2.

Note If an error occurs, all LEDs will flash for *more* than 5 seconds until the device reboots.

Table 2. SN200 LED and Button Definitions

LED/Button	Description
Power LED	• When lit, indicates power is applied.
LAN LED **ETH 0 (SN200/1JS1V/EUI)**	• When lit, indicates the Ethernet connection has a link indication. • Flashes when data is received or transmitted at the Ethernet port.

Table 2. SN200 LED and Button Definitions (Continued)

LED/Button	Description
Status LED (SN200/2JS2V/EUI and SN200/4JS4V/EUI only)	Blinks during bootup phase and goes solid-green afterwards. The LED also blinks (faster) during provisioning and firmware update.
Voice Ports & Phone LED: FXS 0/0–FXS 0/3	• Off when no ongoing or ringing call • Fast blinking when in state ringing • Slow blinking when off-hook or in call
Reset Button (SN200/1JS1V/EUI, not labeled)	The reset button has several functions, as described in appendix F, “Reset Button Functions” on page 53.

Chapter 3 Applications overview

Chapter contents

Introduction

Patton's SmartNode 200 ATAs and VoIP Gateways deliver the features you need for advanced voice applications. They combine high quality voice-over-IP with powerful quality of service, provisioning and monitoring functions to build professional, secure and reliable VoIP network services. This chapter describes typical applications for which this SmartNode is uniquely suited.

Note Detailed configuration information for SmartNode applications can be found online at: www.patton.com/voip-gateway/

Applications

Whether used as an ATA, connecting legacy telephones to an IP PBX or as a VoIP Gateway integrating legacy fax machines into a hosted UC environment, the SN200 adapts to every use-case.

Thanks to the Power over Ethernet option[1], there is no need for a power plug at the remote location.

Operated, managed, and administrated through the Patton Cloud proactive notification in case of a customer network problem, helps to reduce service downtimes and increase customer satisfaction.

Note Additional functions can be unlocked by loading software licenses (such as SIP-TLS & SRTP —see the SN200 product page under Ordering for more details).

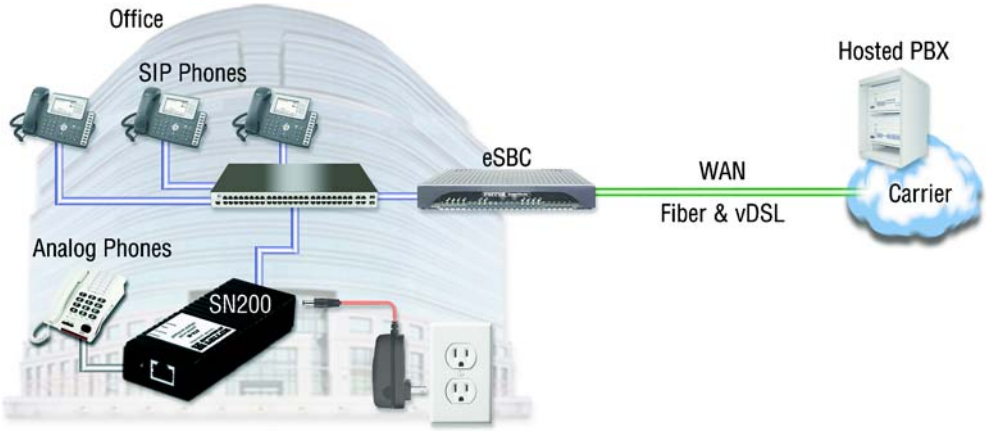


Figure 4. 1-Port SN200 ATA application

1. Depending on model

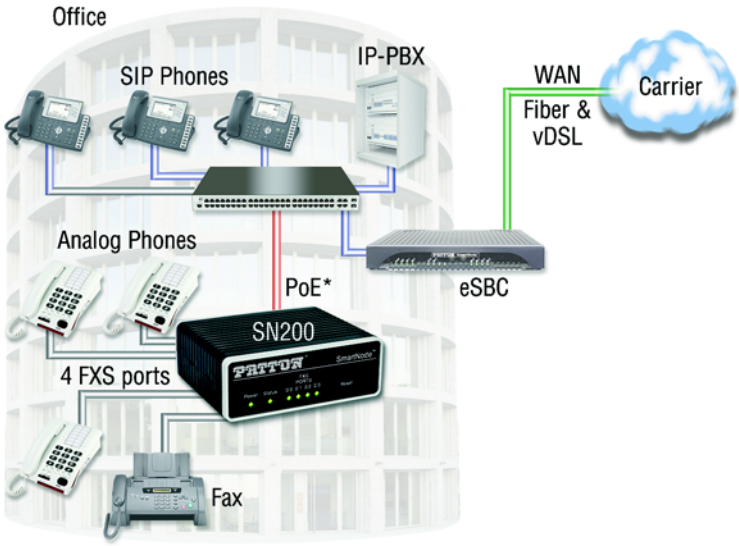


Figure 5. 4-Port SN200 ATA application

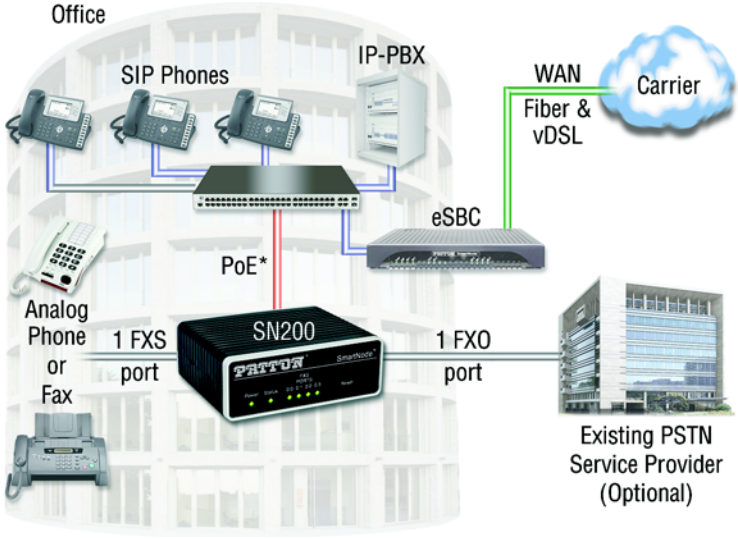


Figure 6. 1 FXS/1 FXO SN200 ATA application

Chapter 4 SmartNode Installation

Chapter contents

Planning the Installation

Before installing the SmartNode device, the following tasks should be completed:

- **Create a network diagram** (see section "Network information" on page 25)
- **Gather IP related information** (see section "IP related information" on page 25 for more information)
- **Install the hardware and software needed to configure the SmartNode device**. (See section "Software tools" on page 26)
- **Verify power source reliability** (see section "Power source" on page 26).

When you finish preparing for SmartNode device installation, go to section "Installing the SmartNode device" on page 26 to install the device.

Site log

Patton recommends that you maintain a site log to record all actions relevant to the system, if you do not already keep such a log. Site log entries should include information such as listed in table 3.

Table 3. Sample site log entries

Entry	Description
Installation	Make a copy of the installation checklist and insert it into the site log
Upgrades and maintenance	Use the site log to record ongoing maintenance and expansion history
Configuration changes	Record all changes and the reasons for them
Maintenance	Schedules, requirements, and procedures performed
Comments	Notes, and problems
Software	Changes and updates to Trinity software

Network information

Network connection considerations that you should take into account for planning are described for several types of network interfaces in the following sections.

Network diagram

Draw a network overview diagram that displays all neighboring IP nodes, connected elements and telephony components.

IP related information

Before you can set up the basic IP connectivity for your SmartNode device you should have the following information:

- IP addresses used for Ethernet LAN port
- Subnet mask used for Ethernet LAN port

- IP addresses and/or URL of SIP servers or Internet telephony services (if used)
- Login and Password for SIP based telephony services
- IP addresses of central TFTP server used for configuration upload and download (optional)

Software tools

You will need a PC (or equivalent) with Windows Telnet or a program such as Tera Term Pro or Putty to configure the software on your SmartNode device. Also you may use your web browser to configure the unit. The WebWizard in this case reduces time to get your unit up and running. See more details on www.patton.com/wizard.

Power source

If you suspect that your AC power is not reliable, for example if room lights flicker often or there is machinery with large motors nearby, have a qualified professional test the power. Patton recommends that you include an uninterruptible power supply (UPS) in the installation to ensure that VoIP service is not impaired if the power fails.

Installing the SmartNode device

SmartNode device installation consists of the following:

- Placing the device at the desired installation location (see page 26)
- Installing cables (see page 27)
- Installing the power supply (see page 28)

When you finish installing the SmartNode device, go to Chapter 5, "Initial Configuration" on page 30.

Placing the SmartNode device

Place the SmartNode device on a desktop or similar sturdy, flat surface. Allow sufficient space at the rear of the chassis for cable connections. Additionally, you should consider the need to access the unit for future upgrades and maintenance.

To prevent overheating and damaging the unit, proper ventilation is required when placing the device; leave at least 2 inches (5 cm) to the left, right, front, and rear of the SmartNode device.

The device should be installed in a dry environment with sufficient space to allow air circulation for cooling. Do not stack multiple SmartNode devices directly on top of one another, and do not place items on top of the device. If you will be installing equipment above the SmartNode device, leave at least 2 inches (5 cm) of clearance between the devices.

Connecting cables

WARNING

Do not work on the system or connect or disconnect cables during periods of lightning activity.

WARNING

The interconnecting cables shall be acceptable for external use and shall be rated for the proper application with respect to voltage, current, anticipated temperature, flammability, and mechanical serviceability.

Connect the cables in the following order:

1. Connect the RJ-11 FXS analog port cable or cables (see page 27)
2. If your device is equipped with an FXO port, connect the RJ-11 FXO analog port cable
3. Connect the 10/100Base-T Ethernet LAN cable (see page 28)

Connecting analog interface cable or cables

SN200 models are available with FXS or with 1 FXS and 1 FXO ports.

Check the product webpage under the ordering tab for a detailed list of available models.

The FXS interfaces are connected to analog devices via cables (see figure 7) terminated with RJ-11 connectors (see section "Analog FXS" on page 46), while the same type of cable and pinout is being used to connect a POTS line to the FXO ports of the SmartNode (see figure 8 on page 28).

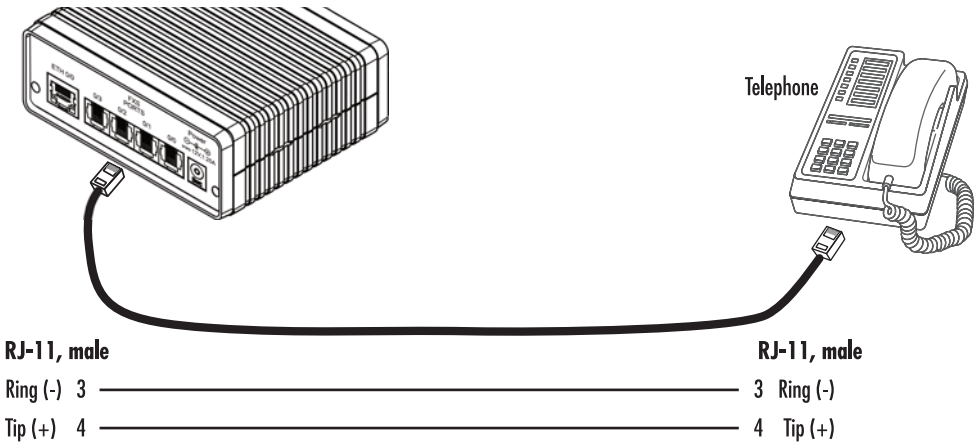


Figure 7. Analog FXS connection

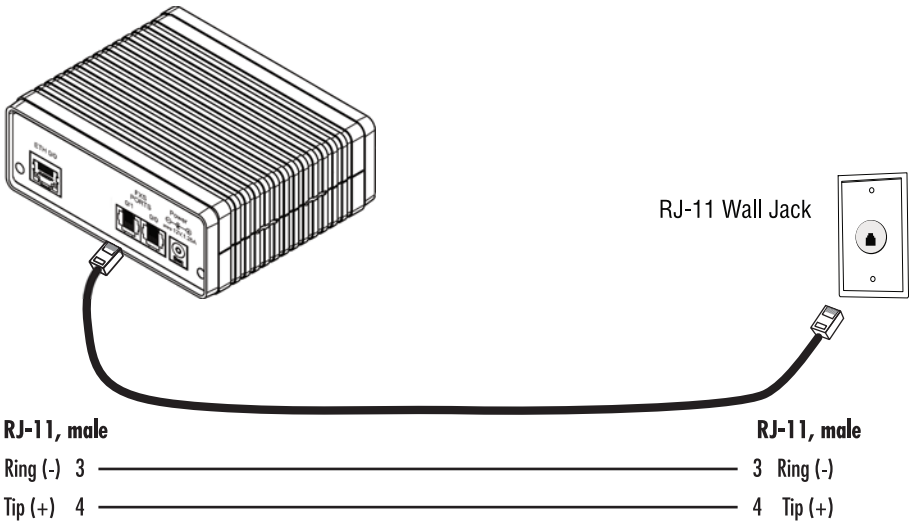


Figure 8. Analog FXO connection

Table 4. RJ-11 socket

Pin	Signal
3	Ring (-)
4	Tip (+)

Connecting the 10/100Base-T Ethernet LAN cable

The SmartNode device has automatic MDX (auto-cross-over) detection and configuration on the Ethernet port.

1. Connect the straight-through wired LAN cable to port ETH 0/0.
2. Connect the other end of the LAN cable to a host or switch.

For details on the Ethernet port pinout and cables, refer to Appendix C, "Cabling" on page 44 and Appendix D, "Port pin-outs" on page 48.

Connecting the power supply

Do the following to connect main power to the SmartNode device:

1. Verify that the AC power supply included with your device is compatible with local standards. If it is not, refer to Chapter 6, "Contacting Patton for Assistance" on page 35 to find out how to replace it with a compatible power supply.

   Note The SmartNode does not have a power switch; it powers on when the device is plugged in.

2. The power connection is made via the barrel jack on the rear panel of the SmartNode. No configuration is necessary for the power supply. Connect the female end (barrel plug) to the barrel jack on the rear of the SmartNode (see figure 2 on page 17).
3. Connect the power supply male connector to an appropriate power outlet.

4. Verify that the *Power* LED (see figure 3 on page 19) is lit. Once the *Status* LED becomes solid the SmartNode device is ready.

Congratulations, you have finished installing the SmartNode device! Now go to Chapter 5, "Initial Configuration" on page 30.

Chapter 5 Initial Configuration

Chapter contents

Introduction

This chapter leads you through the basic steps to set up a new SmartNode device and to download a configuration.

Note If you haven't already installed the SmartNode device, refer to Chapter 4, "SmartNode Installation" on page 24.

See section "Connecting the SN200 to a laptop PC".

Connecting the SN200 to a laptop PC

Verify that the *Power* LED is lit. Once the *Status* LED becomes solid the SmartNode device is ready.

Note The SmartNode device has a fixed IP and a DHCP client setup to simplify configuration. The Ethernet port is equipped with Auto-MDX so you can use a straight-through cable for host or hub/switch connection.

There are two options for configuring the SmartNode device:

1. The SmartNode device is connected to a laptop PC (see figure 9) that is configured with a fixed IP in the same range as the SmartNode device's IP address (for instance: PC's IP address; 192.168.200.20; mask: 255.255.255.0).

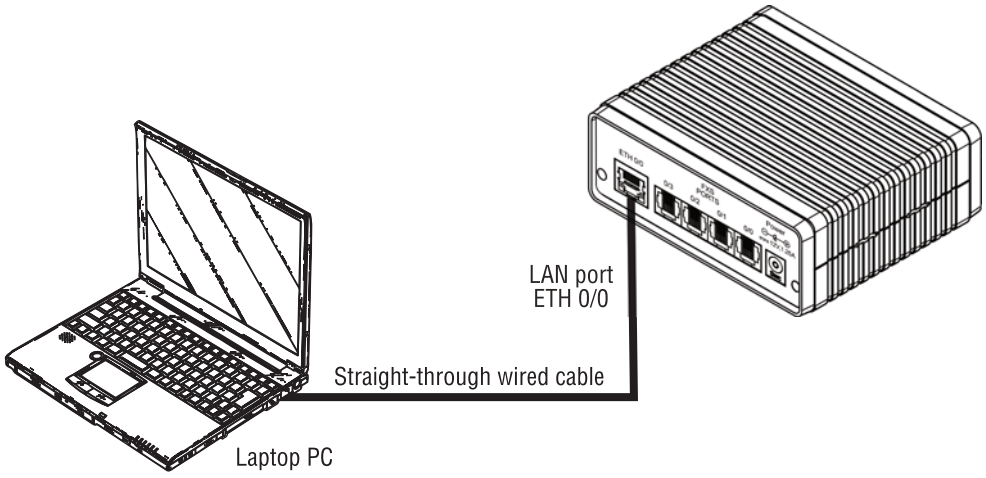


Figure 9. Connecting the SmartNode to a laptop PC

2. The SmartNode device is connected to a local area network (LAN) that has a DHCP server running which assigns an IP address to the SmartNode device (see figure 10). Using the SN Discovery tool, the SmartNode device's IP can be determined.

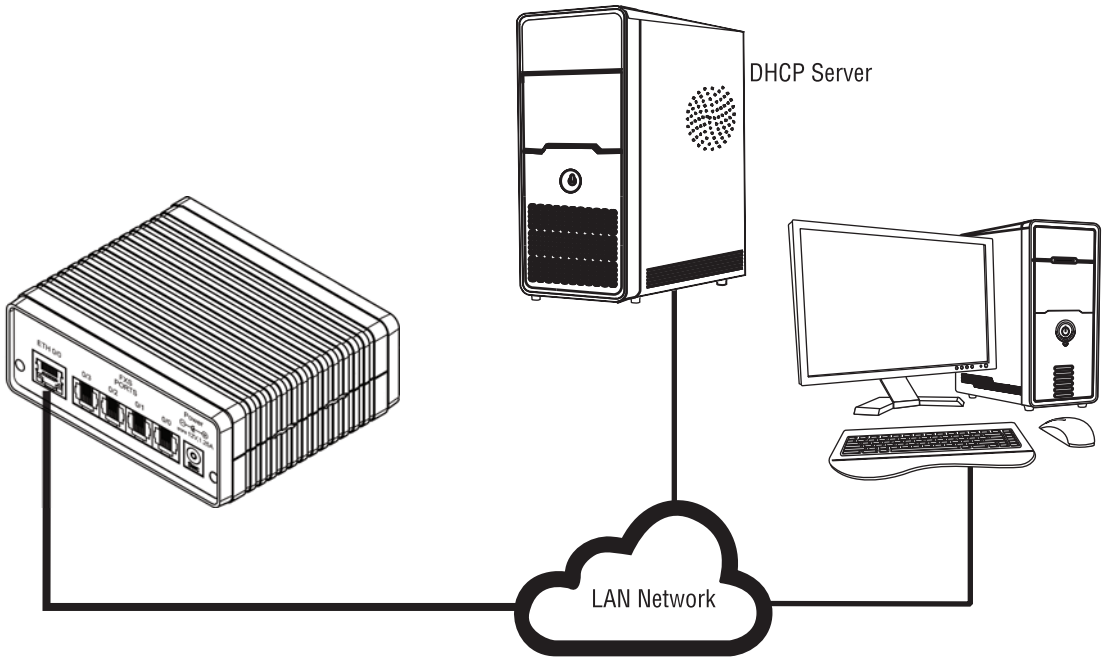


Figure 10. Connecting SmartNode device and PC to a LAN with DHCP server.

You can check the connection to the SmartNode by executing the ping command from the PC command window as follows:

```
ping 192.168.200.10
```

Configure the Desired IP Address

Factory-default IP Settings

The factory default configuration for the Ethernet interface is listed in table 5. The interface bound to *ETH 0/0 (WAN)* has a DHCP client running and a fixed IP address.

Table 5. Factory Default IP Address and Network Mask Configuration

WAN Interface Ethernet 0 (ETH 0/0)	IP Address	Network Mask
Fixed IP	192.168.200.10	255.255.255.0
DHCP client	DHCP	DHCP

If these addresses match with those of your network, go to section "Loading the Configuration (optional)" on page 33. Otherwise, refer to the following sections to change the addresses and network masks.

Login

To access the SmartNode, start the Telnet application. Type either the default IP address into the address field of the Telnet application:

```
192.168.200.10
```

Or use the *SN Discovery Tool* to find out the IP address previously assigned by the DHCP server.

Accessing your SmartNode device via a Telnet session displays the login screen. Type the factory default login: *admin* and leave the password empty. Press the Enter key after the password prompt.

```
login:admin
password: <Enter>
192.168.200.10>
```

After you have successfully logged in you are in the operator execution mode, indicated by > as command line prompt. With the commands *enable* and *configure* you enter the configuration mode.

```
192.168.200.10>enable
192.168.200.10#configure
192.168.200.10(cfg)#
```

Changing the WAN IP address

Select the context IP mode to configure an IP interface.

```
192.168.200.10 (cfg) #context ip ROUTER
192.168.200.10 (ctx-ip) [ROUTER} #
```

Now you can set your IP address and network mask for the interface *ETH 0/0 (WAN)*. Within this example a network 172.16.1.0/24 address is assumed. The IP address in this example is set to *172.16.1.99* (you should set the IP address given to you by your network provider).

```
192.168.200.10(ctx-ip)[Router]#interface WAN
 192.168.200.10(if-ip)[WAN]#no ipaddress
192.168.200.10(if-ip)[WAN]#ipaddress WAN 172.16.1.99/24
2002-10-28T00:09:40 : LOGINFO : Link down on interface WAN.
2002-10-29T00:09:40 : LOGINFO: Link up on interface WAN.
172.16.1.99(if-ip)[WAN]#
```

Copy this modified configuration to you new start-up configuration. This will store your changes in non-volatile memory. Upon the next start-up the system will initialize itself using the modified configuration.

Note The modified configuration is applied immediately. It is not necessary to reboot the device when changing any configuration parameter.

```
172.16.1.99(if-ip) [WAN]#copy running-config startup-config
172.16.1.99(if-ip) [WAN]
```

The SmartNode device can now be connected to your network.

You are responsible for creating a new administrator account to maintain system security. Patton Electronics accepts no responsibility for losses or damage caused by loss or misuse of passwords. Refer to Chapter 4 “Accessing the CLI”, section “Selecting a secure password” in the *Trinity Command Line Reference Guide* for more details.

Loading the Configuration (optional)

The WebWizard Community provides a collection of Wizards that help to reduce the setup time of a Patton device.

Simply download the appropriate Wizard to your device, execute it locally, and you are ready to do phone calls after the SmartNode has rebooted.

Optionally, you may execute the Wizard that matches your application online, and import the generated .cfg config into the SmartNode device.

In addition to that the Knowledgebase provides configuration file templates that may fit your application.

Note If your application is unique and not covered by any of Patton's configuration templates, you can manually configure the SmartNode instead of loading a configuration file template. In that case, refer to the *Trinity Command Line Reference Guide* for information on configuring the SmartNode device.

In this example we assume the TFTP server on the host with the IP address 172.16.1.11 and the configuration named *SN.cfg* in the root directory of the TFTP server.

```
172.16.1.99(if-ip)[WAN]#copy tftp://172.16.1.11/sn.cfg startup-config
172.16.1.99(if-ip)[WAN]#
```

After the SmartNode device has been rebooted the new startup configuration will be activated.

```
172.16.1.99(if-ip)[WAN]#reload
Press 'yes' to restart, 'no' to cancel :yes
The system is going down NOW
```

Additional Information

For detailed information about configuring and operating guidance, set-up procedures, and troubleshooting, refer to the *Trinity Command Line Reference Guide* available online at www.patton.com/manuals.

Chapter 6 Contacting Patton for Assistance

Chapter contents

Introduction

This chapter contains the following information:

- "Contact information"—describes how to contact Patton technical support for assistance.
- "Warranty Service and Returned Merchandise Authorizations (RMAs)"—contains information about the warranty and obtaining a return merchandise authorization (RMA).

Contact information

Patton Electronics offers a wide array of free technical services. If you have questions about any of our other products we recommend you begin your search for answers by using our technical knowledge base. Here, we have gathered together many of the more commonly asked questions and compiled them into a searchable database to help you quickly solve your problems.

Contacting Patton Technical Services for Free Support

Region	North America	Western Europe	Central & Eastern Europe
Location	**Maryland, USA**	**Bern, Switzerland**	**Budapest, Hungary**
Time Zone	EST/EDT UTC/GMT - 4/5 hours	CET/CEDT UTC/GMT + 1/2 hours	CET/CEDT UTC/GMT + 1/2 hours
Business Hours	Monday-Friday 8:00am to 5:00pm	Monday-Friday 09:00 to 12:00 13:30 to 17:30	Monday-Friday 8:30 to 17:00
Email	support@patton.com	support@patton.com	support@patton.com
Phone	+ 1 301 975 1007	+41 31 985 25 55	+36 439 3835
Fax	+1 301 869 9293	+41 31 985 2526	

Warranty Service and Returned Merchandise Authorizations (RMAs)

Patton Electronics is an ISO-9001 certified manufacturer and our products are carefully tested before shipment. All of our products are backed by a comprehensive warranty program.

Note If you purchased your equipment from a Patton Electronics reseller, ask your reseller how you should proceed with warranty service. It is often more convenient for you to work with your local reseller to obtain a replacement. Patton services our products no matter how you acquired them.

Warranty coverage

Our products are under warranty to be free from defects, and we will, at our option, repair or replace the product should it fail within one year from the first date of shipment. Our warranty is limited to defects in workmanship or materials, and does not cover customer damage, lightning or power surge damage, abuse, or unauthorized modification.

Out-of-warranty service

Patton services what we sell, no matter how you acquired it, including malfunctioning products that are no longer under warranty. Our products have a flat fee for repairs. Units damaged by lightning or other catastrophes may require replacement.

Returns for credit

Customer satisfaction is important to us, therefore any product may be returned with authorization within 30 days from the shipment date for a full credit of the purchase price. If you have ordered the wrong equipment or you are dissatisfied in any way, please contact us to request an RMA number to accept your return. Patton is not responsible for equipment returned without a Return Authorization.

Return for credit policy

- Less than 30 days: No Charge. Your credit will be issued upon receipt and inspection of the equipment.
- 30 to 60 days: We will add a 20% restocking charge (crediting your account with 80% of the purchase price).
- Over 60 days: Products will be accepted for repairs only.

RMA numbers

RMA numbers are required for all product returns. You can obtain an RMA by doing one of the following:

- Completing a request on the RMA Request page in the *Support* section at **www.patton.com**
- By calling **+1 (301) 975-1007** and speaking to a Technical Support Engineer
- By sending an e-mail to **returns@patton.com**

All returned units must have the RMA number clearly visible on the outside of the shipping container. Please use the original packing material that the device came in or pack the unit securely to avoid damage during shipping.

Shipping instructions

The RMA number should be clearly visible on the address label. Our shipping address is as follows:

Patton Electronics Company
RMA#: xxxx
7622 Rickenbacker Dr.
Gaithersburg, MD 20879-4773 USA

Patton will ship the equipment back to you in the same manner you ship it to us. Patton will pay the return shipping costs.

Appendix A Compliance Information

Chapter contents

Compliance

EMC

- FCC Part 15, Class B
- EN55032, Class B
- EN55024

Safety

- UL 62368-1/CSA C22.2 N0. 62368-1
- IEC/62368-1
- AS/NZS 62368-1

Radio and TV Interference (FCC Part 15)

This equipment generates and uses radio frequency energy, and if not installed and used properly—that is, in strict accordance with the manufacturer's instructions—may cause interference to radio and television reception. This equipment has been tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart B of Part 15 of FCC rules, which are designed to provide reasonable protection from such interference in a commercial installation. However, there is no guarantee that interference will not occur in a particular installation. If the equipment causes interference to radio or television reception, which can be determined by disconnecting the cables, try to correct the interference by one or more of the following measures: moving the computing equipment away from the receiver, re-orienting the receiving antenna, and/or plugging the receiving equipment into a different AC outlet (such that the computing equipment and receiver are on different branches).

EC Declaration of Conformity

We certify that the apparatus identified above conforms to the requirements of Council Directive 2014/30/EU on the approximation of the laws of the member states relating to electromagnetic compatibility; Council Directive 2014/35/EU on the approximation of the laws of the member states relating to electrical equipment designed for use within certain voltage limits; Council Directive 2011/65/EU as modified by Council Directive 2015/863/EU on the approximation of the laws of the member states relating to RoHS and REACH compliance; and Council Directive 2009/125/EC establishing a framework for the setting of ecodesign requirements for energy-related products.

Authorized European Representative

Martin Green
European Compliance Services Limited
Milestone house
Longcot Road
Shrivenham
SN6 8AL, UK

Appendix B Specifications

Chapter contents

Note Refer to the software feature matrix for the most up-to-date specifications.

Voice Connectivity

1, 2 or 4 FXS ports, RJ-11/12

or

1 FXS port and 1 FXO port, RJ-11/12

2-wire Loopstart

EuroPOTS (ETSI EG201188)

Programmable AC impedance, feeding, ring and onhook voltage

Caller-ID FSK and ITU V.23/Bell 202 generation

5 REN load on FXS port

Data Connectivity

One 10/100Base-TX Ethernet port

All ports full duplex, auto-sensing, auto-MDX

Voice Processing (signaling dependent)

Full-duplex channels with voice codecs:

- G.711 a-law & u-law
- G.722-64k
- G.726 (16, 24, 32 Kbps)
- G.729ab (8 kbps)

G.168-2004 echo cancellation (64 ms)

Up to 4 simultaneous low bandwidth, high definition voice or T.38 fax calls

DTMF detection and generation

Silence suppression and comfort noise

Adaptive and configurable dejitter buffer

Configurable RTP packet length

Configurable tones (dial, ringing, busy, etc.)

RTP/RTCP (RFC 1889)

SRTP (RFC 3711)

Fax support

Automatic fax detection mechanism

T.38 Fax-Relay (Gr. 3 Fax, 9.6 k, 14.4 K)

G.711 Fax-Bypass

Voice Signaling

SIPv2

SIPv2 over IPv6

SIPv2 over TLS - (licensed feature - separate purchase)

SIP call transfer, redirect

Overlap or en-bloc dialing

DTMF in-band, out-of-band

Voice Routing—session router

Local switching (hairpinning)

Least cost routing

Interface huntgroups

Call-Distribution groups

Number blocking

Call Routing Criteria:

- Interface
- Calling/called party number
- Time of day, day of week, date
- Wildcard and regular expression matching

Regular expression number manipulation functions:

- Replace numbers
- Add/remove digits
- Pattern matching and replacement

IP Services

IPv4 & IPv6 router (Dual Stack)

ICMP redirect (RFC 792); Packet fragmentation

DiffServe/ToS set or queue per header bits

Packet Policing discards excess traffic

DHCP client and server (IPv4 and IPv6—Dual Stack)

DNS client and relay-server, DynDNS

Management

Patton Cloud Management

Web-based GUI; Trinity WEB Wizard

Industry standard CLI with remote Telnet and SSH access, fully documented

HTTP and HTTPs web management and firmware loading

TFTP configuration and firmware loading

HTTPS configuration and firmware provisioning

SNMP v1, v2, v3 agent (MIB II and private MIB)

Built-in diagnostic tools (trace, debug)

Secure Auto-provisioning

TR-069 config file and software image provisioning

System

VoIP SoC: DSPG DVF9929

RAM Memory: 256MByte

Flash Memory: 64MByte

Physical

Power Consumption: <10W

Operating Temperature: 32-104°F (0-40°C)

Operating humidity: up to 90%, non condensing

Appendix C **Cabling**

Chapter contents

Introduction

This section provides information on the cables used to connect the SmartNode device to the existing network infrastructure and to third party products.

Ethernet

Ethernet devices (10/100Base-T) are connected to the SmartNode over a cable with an RJ-45 plug. The Ethernet port on the SmartNode device is Auto-MDX. Use any straight or crossover cable to a host, switch, PC or other device.

CAUTION

The interconnecting cable shall be acceptable for external use an shall be rated for the proper application with respect to voltage, current, anticipated temperature, flammability, and mechanical serviceability.

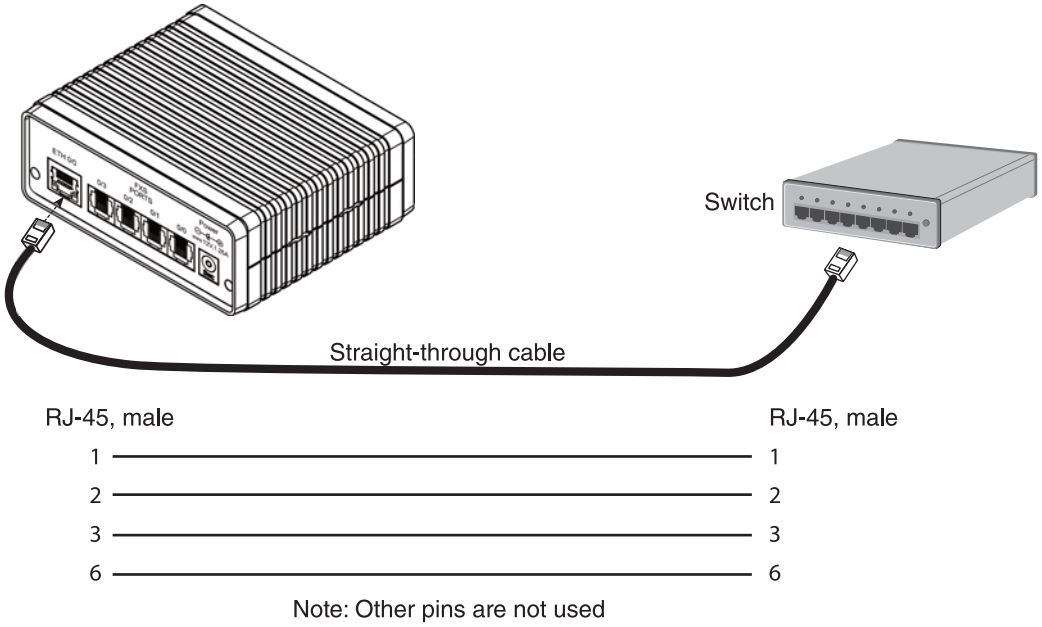


Figure 11. Typical Ethernet straight-through cable diagram for 10/100Base-T

Analog FXS

CAUTION

The Interconnecting cables shall be acceptable for external use and shall be rated for the proper application with respect to voltage, current, anticipated temperature, flammability, and mechanical serviceability.

The FXS ports are connected to analog terminals (phones, fax machines, answering machines, etc.) via cables terminated with RJ-11 connectors (see section "FXS port" on page 49 for details on port pinouts).

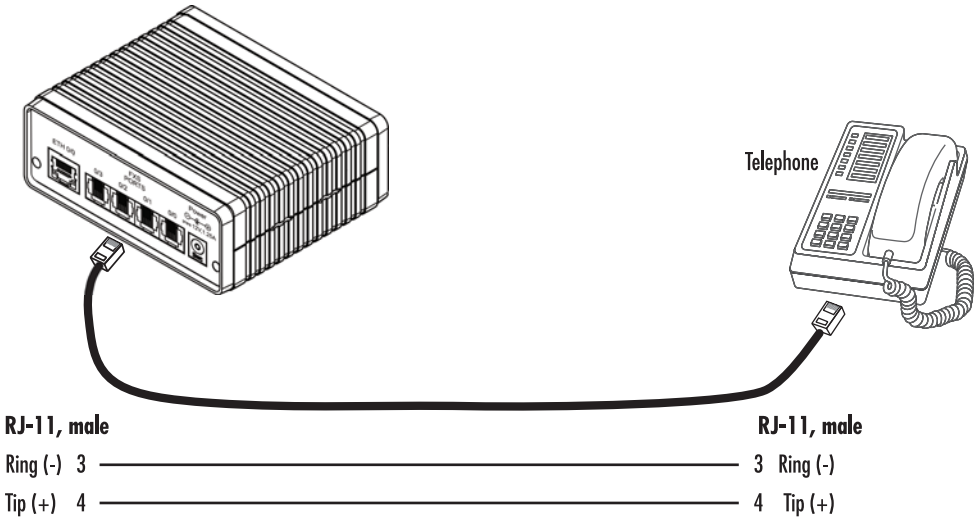


Figure 12. Connecting an FXS device

Analog FXO

CAUTION

The Interconnecting cable shall be acceptable for external use and shall be rated for the proper application with respect to voltage, current, anticipated temperature, flammability, and mechanical serviceability.

Applicable to a SmartNode equipped with an FXO port. The FXO port is connected to an analog phone line via a cable terminated with an RJ-11 connector (see section "FXO port" on page 50 for details on port pinouts).

Note The phone line socket (connector type and pinout) available from the public network vary from country to country. Refer to technical information available from your local operator for additional cabling information.

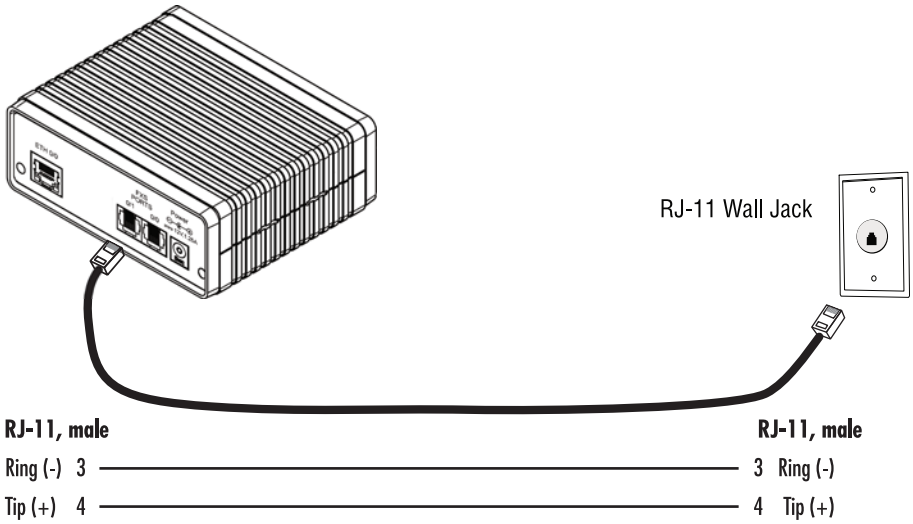


Figure 13. Connecting to an FXO line jack

Appendix D **Port pin-outs**

Chapter contents

Introduction

This section provides pin-out information for the ports of the SmartNode.

Ethernet

Table 6. 10/100 Base-T RJ-45 socket

Pin	Signal
1	TX+
2	TX-
3	RX+
6	RX-

Note Pins not listed are not used.

FXS port

The FXS ports use an RJ-11 connector with 6 positions. The middle two positions 3 and 4 are used according to table 7 and figure 14.

Table 7. RJ-11 socket

Pin	Signal
3	Ring (-)
4	Tip (+)

Note Pins not listed are not used.

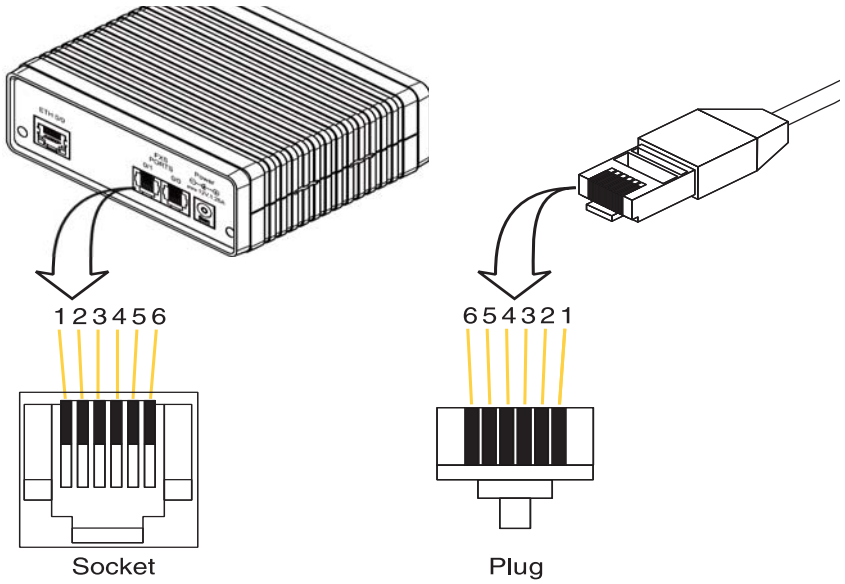


Figure 14. RJ-11 pinout diagram

FXO port

The FXO port uses an RJ-11 connector with 6 positions. The middle two positions 3 and 4 are used according to table 8 and figure 15.

Note Pins not listed are not used.

Table 8. RJ-11 socket

Pin	Signal
3	Ring (-)
4	Tip (+)

Note Pins not listed are not used.

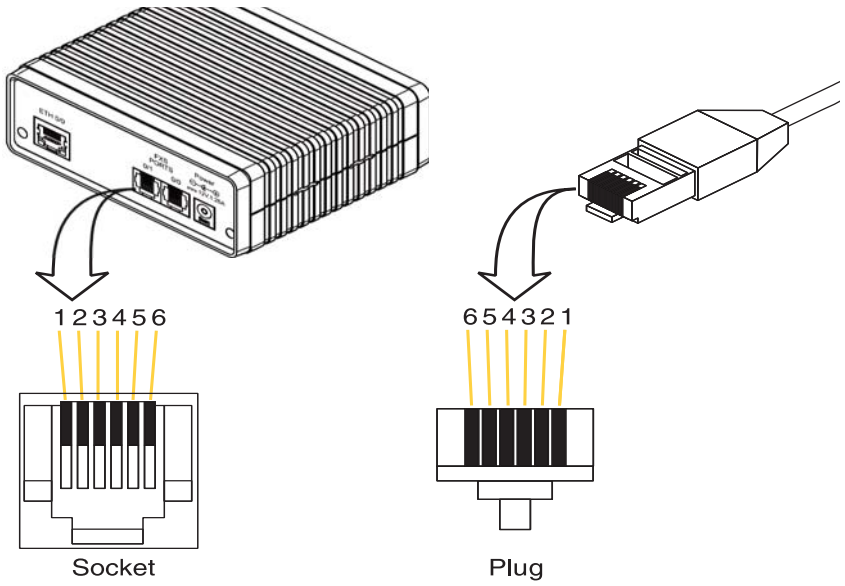


Figure 15. RJ-11 pinout diagram

Appendix E SmartNode Device Factory Configuration

Chapter contents

Introduction

Factory configuration settings for the SmartNode device can be obtained with the following command through the CLI;

```
login: admin
password: <Enter>
192.168.200.10>show config:shipping-config
```

See Chapter 5, "Initial Configuration" on page 30 for more details about IP address settings for initial configuration.

Appendix F Reset Button Functions

Chapter contents

Introduction

The *Reset* button (see figure 16) is used to do the following:

- Reboot the SmartNode device (see section "Resetting the SmartNode device when it is operating and the Power LED is lit" on page 55)
- Erase the *startup-config* settings, which is followed by a SmartNode device reboot as indicated by the slow blinking of all LEDs (see section "Resetting the SmartNode device when it is operating and the Power LED is lit" on page 55)
- Factory reset, which is followed by a device reboot as indicated by the fast blinking of all LEDs (see section "Resetting the SmartNode device when it is operating and the Power LED is lit" on page 55)

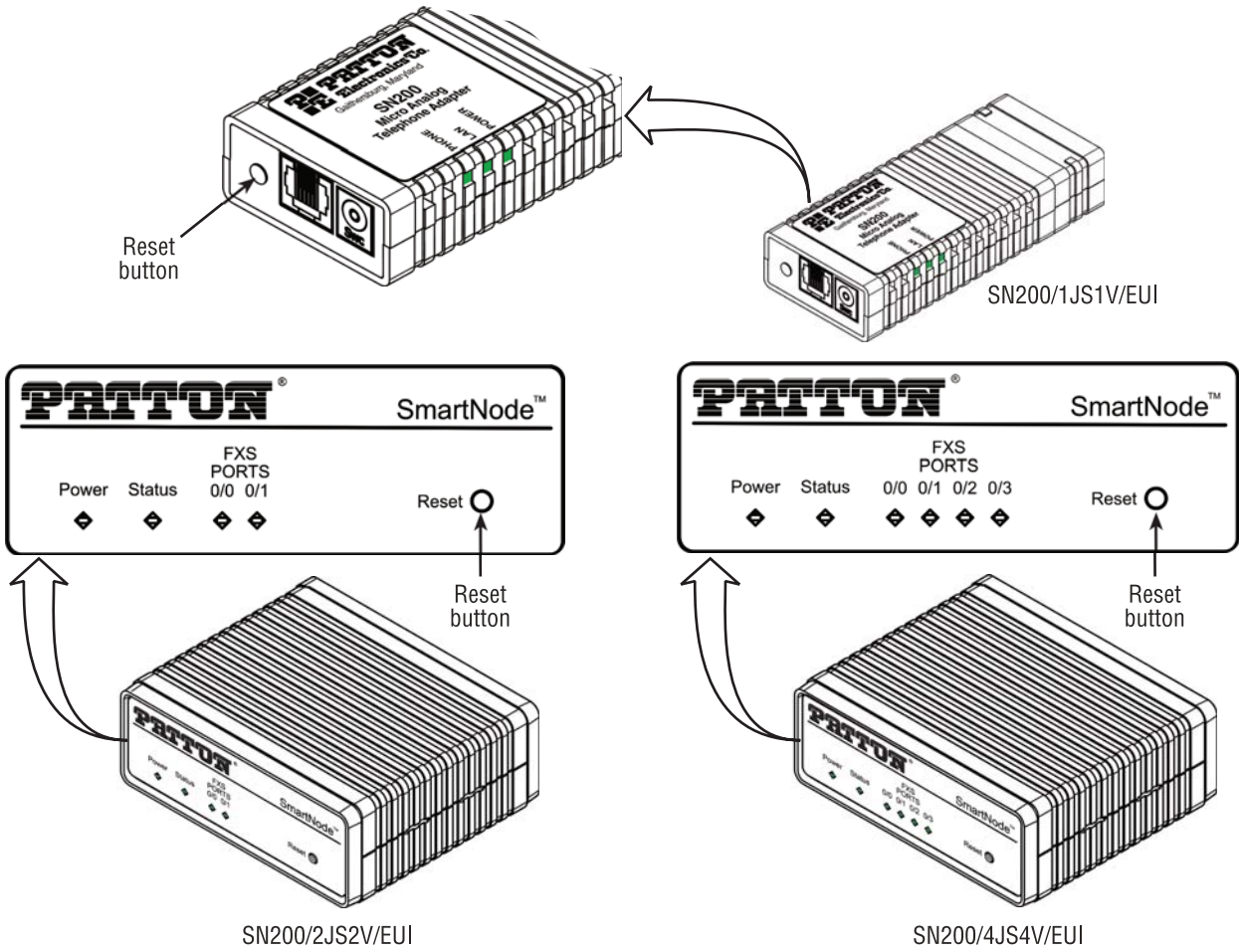


Figure 16. SN200 *Reset* button

Resetting the SmartNode device when it is operating and the *Power* LED is lit

The *Reset* button has the following behaviors depending on how many seconds (see figure 17) the button is pressed (see table 9 for the results from pressing the button).

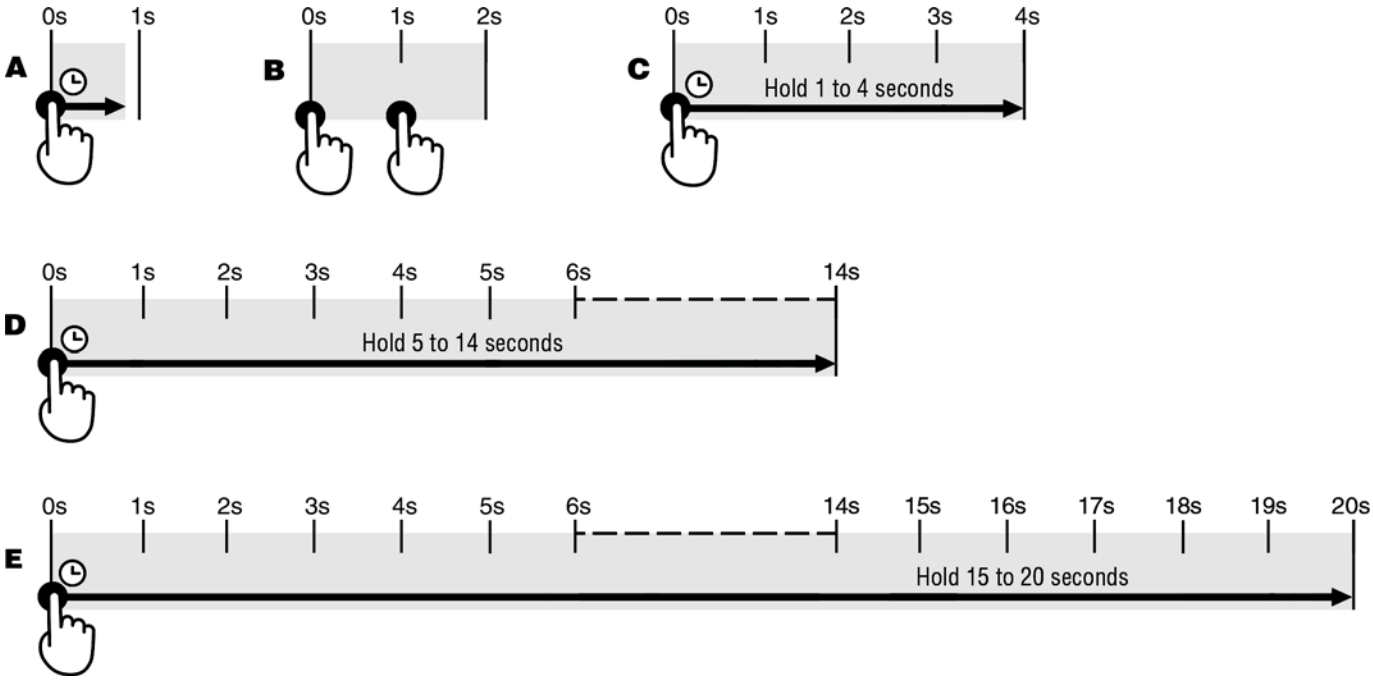


Figure 17. Reset button periods (in seconds) for performing actions

Table 9. Results from pressing the Reset button

Period	Action
A (less than 1 second)	Reboot device
B (press twice with 1-second gap between presses)	Patton Cloud On-boarding procedure. Do the following: 1. Log into Patton Cloud at https://patton.io. 2. Click on *Devices*. 3. Click on *Register Device(s)* to register the SmartNode device.
C (1 to 4 seconds)	No action
D (5 to 14 seconds)	• Erase *startup-config* • Reboot (indicated by the slow blinking of all LEDs
E (15 to 20 seconds)	• Factory reset which erases entire flash memory except for *shipping-config*, shipping wizards, default root CAs and software licenses • Reboot (indicated by fast blinking of all LEDs)

Very exceptional case—minimal config recovery

If, after performing the procedure in section "Resetting the SmartNode device when it is operating and the Power LED is lit" on page 55, the SmartNode device is still not operational, the following may remedy the problem by erasing the entire contents of flash memory (no exceptions).

However it is recommended that in such a case the device be sent to Patton for analysis and repair. See section "Warranty Service and Returned Merchandise Authorizations (RMAs)" on page 36 for details.

The following procedure is NOT standard and is NOT to be used to perform a factory reset. It should ONLY be used as a last resort for a minimal recovery of the device when it is in an undefined state, and if the instructions in section "Resetting the SmartNode device when it is operating and the Power LED is lit" on page 55 did not provide a remedy.

Performing the following procedure will result in loss of all data, including the *shipping-config*, software licenses, Wizards, *backup-configs*, etc. The device will have to be manually set up afterward.

Do the following:

1. While pressing and holding the *Reset* button, apply power to the SmartNode device. The *Status* LED flashes quickly for 2 seconds, during which time the *Reset* button must remain pressed.
2. The *Status* LED will begin a series of blink pattern starting with 1-blink, pause.

Table 10. Using the *Reset* button to switch to a backup image

LED Blink Pattern	Action
1-blink, pause	Boot normally
2-blinks, pause	Boot normally (device only has a single image)
3-blinks, pause	Erase entire contents of flash memory (no exceptions), then boot. **Note** Erasing flash memory also deletes previously purchased and loaded software license keys.

3. Repeatedly pressing and releasing the *Reset* button will cycle through the blink patterns.
4. When you get to the 3-blink pattern that will erase the entire flash memory (see table 10), release the *Reset* button. 10 seconds later, flash memory will be erased, then the device will boot.

5. Once booted up, the device will run using the “minimal-config”:

```
#-----------------------------------------------------------------#
#                                                                 #
# Minimal configuration file                                      #
#                                                                 #
#-----------------------------------------------------------------#

cli version 4.00

telnet-server
  shutdown

ssh-server
  no shutdown

web-server http
  shutdown

web-server https
  shutdown

context ip ROUTER

  interface LAN
    ipaddress LAN 192.168.200.10/24
    ipaddress DHCP dhcp

port ethernet 0 0
  bind interface ROUTER LAN
  no shutdown
```

Appendix G End User License Agreement

Chapter contents

End User License Agreement

By opening this package, operating the Designated Equipment or downloading the Program(s) electronically, the End User agrees to the following conditions:

1. Definitions

A) "Effective Date" shall mean the earliest date of purchase or download of a product containing the Patton Electronics Company Program(s) or the Program(s) themselves.

B) "Program(s)" shall mean all software, software documentation, source code, object code, or executable code.

C) "End User" shall mean the person or organization which has valid title to the Designated Equipment.

D) "Designated Equipment" shall mean the hardware on which the Program(s) have been designed and provided to operate by the End User.

2. Title

Title to the Program(s), all copies of the Program(s), all patent rights, copyrights, trade secrets and proprietary information in the Program(s), worldwide, remains with Patton Electronics Company or its licensors.

Patton does not convey any intellectual property title or rights in the Licensed Products to Licensee. All Licensed Products furnished by Patton, and all copies thereof, and compilations, programmatic extension, and all Patches, Updates, Upgrades and Platform Releases, are and shall remain the property of Patton or Patton's licensors, as applicable. Further, the Licensed Products provided under this Agreement are not custom software but are standard commercial software. Except for the license use rights otherwise expressly provided in this Agreement, no right, title or interest in Patton Licensed Products is granted hereunder. Licensee shall not use any proprietary information of Patton to create any computer software program or user documentation, which is substantially similar to the Licensed Products.

3. Term

The term of this Agreement is from the Effective Date until title of the Designated Equipment is transferred by End User or unless the license is terminated earlier as defined in section "6. Termination" on page 60.

4. Grant of License

A) During the term of this Agreement, Patton Electronics Company grants a personal, non-transferable, non-assignable and non-exclusive license to the End User to use the Program(s) only with the Designated Equipment at a site owned or leased by the End User.

B) The End User may copy licensed Program(s) as necessary for backup purposes only for use with the Designated Equipment that was first purchased or used or its temporary or permanent replacement.

C) The End User is prohibited from disassembling; decompiling, reverse-engineering or otherwise attempting to discover or disclose the Program(s), source code, methods or concepts embodied in the Program(s) or having the same done by another party.

D) Should End User transfer title of the Designated Equipment to a third party after entering into this license agreement, End User is obligated to inform the third party in writing that a separate End User License Agreement from Patton Electronics Company is required to operate the Designated Equipment.

5. Warranty

The Program(s) are provided "as is" without warranty of any kind. Patton Electronics Company and its licensors disclaim all warranties, either express or implied, including but not limited to the implied warranties of merchantability, fitness for a particular purpose or non-infringement. In no event shall Patton Electronics Company or its licensors be liable for any damages whatsoever (including, without limitation, damages for loss of business profits, business interruption, loss of business information, or other pecuniary loss) arising out of the use of or inability to use the Program(s), even if Patton Electronics Company has been advised of the possibility of such damages. Because some states do not allow the exclusion or limitation of liability for consequential or incidental damages, the above limitation may not apply to you.

If the Program(s) are acquired by or on behalf of a unit or agency of the United States Government, the Government agrees that such Program(s) are "commercial computer software" or "computer software documentation" and that, absent a written agreement to the contrary, the Government's rights with respect to such Program(s) are limited by the terms of this Agreement, pursuant to Federal Acquisition Regulations 12.212(a) and/or DEARS 227.7202-1(a) and/or sub-paragraphs (a) through (d) of the "Commercial Computer Software—Restricted Rights" clause at 48 C.F.R. 52.227-19 of the Federal Acquisition Regulations as applicable.

6. Termination

A) The End User may terminate this agreement by returning the Designated Equipment and destroying all copies of the licensed Program(s).

B) Patton Electronics Company may terminate this Agreement should End User violate any of the provisions of section "4. Grant of License" on page 59.

C) Upon termination for **A** or **B** above or the end of the Term, End User is required to destroy all copies of the licensed Program(s)

7. Notices

Patton devices may log, collect and report data related to installed software, licenses, feature utilization, product performance, device management, service quality and other parameters which is used for quality control, product improvement, license management, service level management and technical support. Collected data may be reported to Patton or a service provider delivering its services connected to the device.

Patton may use this information for other business purposes, such as to alerting you to updated products or services, securing access to software updates, and assisting in order processing.

Any and all information collected by Patton or its assigns will be kept strictly confidential and will not be sold, rented, loaned, or otherwise disclosed to any third party except as required by law.

8. Other Licenses

The Program may be subject to licenses extended by third parties. Accordingly, Patton Electronics Company licenses the Programs subject to the terms and conditions dictated by third parties. Third party software identified to the Programs includes:

- The LGPL (Lesser General Public License) open source license distributed to you pursuant to the LGPL license terms (**http://www.gnu.org/licenses/lgpl.html**).
- RedBoot (Red Hat Embedded Debug and Bootstrap) embedded system debug/bootstrap environment from Red Hat distributed to you pursuant to the eCos license terms (**ecos.sourceware.org/license-overview.html**) and GNU General Public License (GPL) terms (**www.gnu.org/copyleft/gpl.html**). Source code is available upon request.

9. Unenforceable Provisions

If any part of these terms and conditions are found to be invalid or unenforceable under applicable law, such part will be ineffective to the extent of such invalid or unenforceable part only, without in any way affecting the remaining parts of these terms and conditions.

10. Governing Law

The rights and obligations of the parties pursuant to these terms and conditions are governed by, and shall be construed in accordance with, the laws of the State of Maryland, USA.

User may be subject to other local, provincial or state and national laws. User hereby irrevocably submits to the exclusive jurisdiction of the courts of the State of Maryland, USA for any dispute arising under or relating to this agreement and waives user's right to institute legal proceedings in any other jurisdiction. Patton shall be entitled to institute legal proceedings in connection with any matter arising under this agreement in any jurisdiction where User resides, does business, or has assets.

11. Waiver

No waiver of any of the provisions of these terms and conditions will be deemed to constitute a waiver of any other provision nor shall such a waiver constitute a continuing waiver unless otherwise expressly provided in writing duly executed by the party to be bound thereby. Any other terms and conditions of sale, to the extent not inconsistent herein, regarding a Patton device, program, license or service remain in full force and effect.